App. No. 09/995,885
Art Unit 1725

CLEAN VERSION OF AMENDED CLAIMS

1. A method of welding, comprising:

applying a laser beam onto a seam of a first element and a second element, where the laser beam is of sufficient energy to melt a portion of the material of the first and second element onto which it is applied, oscillating the laser beam such that a laser spot of the laser beam scans back and forth across the seam, wherein oscillating the laser beam creates an effective laser spot size larger than the laser spot size, moving the oscillating laser beam along the seam, wherein the first element and second element are welded as the oscillating laser beam moves along the seam.

2. The method of claim 1, wherein a portion of the laser spot misses the seam,

further comprising redirecting the portion of the laser spot onto the seam.

3. The method of claim 1, wherein said effective laser spot size ranges from two to four times the size of said seam.

4. The method of claim 1, wherein said laser beam is produced by a laser selected from the group consisting of Nd:YAG, Nd:Glass, Nd:YVO, CO, CO2, Cr:Ruby, diode laser, diode pumped laser, and derivatives thereof.

5. The method of claim 1, further comprising performing the welding in an inert atmosphere.

6. The method of claim 5, wherein said inert atmosphere is argon.

7. A method of edge welding, comprising:

A. applying a laser beam onto a seam of a first element and a second element,

i) where said laser beam comprises

a. a diameter and

b. sufficient energy to melt a portion of said first and said second element onto which it is applied, and

B. oscillating said laser beam such that a laser spot of said laser beam scans back and forth across said seam,

wherein oscillating said laser beam creates an effective laser spot size larger than said diameter of said laser beam; and

C. moving said oscillating laser beam along said seam,

wherein said first element and said second element are welded as said oscillating laser beam moves along said seam.

8. The method of claim 7, wherein a portion of the laser spot misses the seam,

further comprising redirecting the portion of the laser spot onto the seam.

9. The method of claim 7 wherein said effective laser spot size ranges from two to four times the size of said seam.

10. The method of claim 7 wherein said laser beam is produced by a laser selected from the group consisting of Nd:YAG, Nd:Glass, Nd:YVO, CO, CO2, Cr:Ruby, diode laser, diode pumped laser, and derivatives thereof.

11. The method of claim 7, further comprising performing the welding in an inert atmosphere.

12. The method of claim 11, wherein said inert atmosphere is argon.

13. A method of edge welding, comprising:

A. welding a seam of a first element and a second element comprising:

i) directing a laser beam onto a beam splitter, whereby two laser beams are created;

ii) redirecting both of said two beams through a focusing lens, whereby said two laser beams are focused onto said seam of said first element and said second element;

a) where said two laser beams comprise

i. a diameter and

ii. sufficient energy to melt a portion of said first and said second element onto which it is applied, and

b) oscillating said two laser beams such that a laser spot of said two laser

beams scans back and forth across said seam,

wherein oscillating said two laser beams creates an effective laser spot size larger than said diameter of said two laser beams; and

c) moving said oscillating two laser beams along said seam,

wherein said first element and said second element are welded as said oscillating two laser beams move along said seam.

14. The method of claim 13, wherein a portion of the laser spot misses the seam,

further comprising redirecting the portion of the laser spot onto the seam.

15. The method of claim 13, wherein said effective laser spot size ranges from two to four times the size of said seam.

16. The method of claim 13, wherein said laser beam is produced by a laser selected from the group consisting of Nd:YAG, Nd:Glass, Nd:YVO, CO, CO2, Cr:Ruby, diode laser, diode pumped laser, and derivatives thereof.

17. The method of claim 13, further comprising performing the welding in an inert atmosphere.

18. The method of claim 17, wherein said inert atmosphere is argon.